

Introduction

This report on avian influenza in Asia was first issued in July 2005, and has been updated with information on new outbreaks and public health advisories. The report gives readers background on the virus, information on associated dangers and health risks, resources where they can find more information, and some basic advice on steps they can take to help minimize their risk. OSAC makes every effort to ensure the accuracy and content of the reports, but the information should not be viewed as a substitute for consultations with certified medical practitioners.

Summary

Avian influenza, or bird flu, is a contagious viral disease caused by certain types of influenza viruses that occur naturally among birds. These viruses do not usually infect humans, but several cases of human infection with bird flu viruses have recently been reported. These viruses are currently circulating in bird populations in Asia, and have resulted in severe illness and death in humans. Since the recent outbreaks of this strain began in 2004, more than 115 people have been confirmed as infected and 59 have died. Most human cases are thought to have occurred through contact with infected poultry or contaminated surfaces. However, some scientists worry that if the virus were able to mutate and be able both to infect people and then to spread easily from person to person in a sustained fashion, a global "influenza pandemic" (worldwide outbreak of disease) could begin.

Background on Avian Influenza

Influenza viruses are classified into three types, known as types A, B, and C. Influenza viruses infect a wide range of animals, including humans, birds, pigs, horses, seals, and whales, but their major reservoirs are in wild bird populations. Influenza B and C viruses circulate only among humans, and only A and B viruses cause significant disease.

While all subtypes can be found in wild migratory birds, only three Influenza A subtypes have circulated widely in humans. Influenza A subtypes that only infect birds are known as avian influenza viruses. These viruses do not usually infect humans, but a limited number of human infections with bird flu viruses have been detected since 1997. Most reported human cases are believed to have resulted from direct contact with infected birds; however, scientists and public health researchers closely monitor avian influenza cases for other modes of transmission, such as from human to human.



Live ducks at a Hanoi market.
 Photo copyright 2005 AP

Certain birds, particularly migratory water birds, act as hosts for influenza viruses by carrying the virus in their intestines and shedding it. Most often, these wild birds do not get sick, but can nonetheless spread influenza to other birds. Infection with certain avian influenza subtypes can cause widespread disease and death among some species of domesticated birds. Avian influenza outbreaks among poultry occur worldwide from time to time. Since 1997, more than 16 outbreaks have occurred among poultry in the United States.

While none of the sporadic cases of Avian Influenza in humans reported over the last decade have sparked an epidemic, three new Influenza A virus subtypes have caused global pandemics during the 20th century, all of which spread around the world within one year of detection. In 1918-1919, the "Spanish Flu" (H1N1) led to more than 500,000 deaths in the U.S., and up to 50 million worldwide. In 1957-58, the "Asian Flu" (H2N2) spread worldwide, eventually killing an estimated 2 million people. In 1968-1969, the "Hong Kong Flu" (H3N2) killed around 750,000 people. While the origin of the 1918 virus is unclear, the 1957 and 1968 viruses are thought to have resulted human and avian influenza viruses.

At present, avian influenza infections in humans remain rare. The most common method of infection is from direct contact with an infected bird or with a surface contaminated with secretions from an infected bird. This has occurred in populations and communities with routine contact with infected birds, such as in live poultry markets and on poultry farms. For people who are not in close contact with infected or potentially infected birds and contaminated surfaces, the risk of infection is low. There is no known risk of becoming infected by an avian influenza virus by eating cooked poultry, since cooking destroys influenza viruses.

Genetic Reassortment and Threats to Humans

Most viruses are very efficient at replication, and are able to create a large number of copies without many mistakes. By contrast, influenza viruses have faulty

Recent Outbreaks of Avian Influenza

1997: Hong Kong (H5N1)

- 18 hospitalized, 6 died
- Rare person- person infection noted

1999: China and Hong Kong (H9N2)

- 2 children infected, both recovered
- Poultry believed to be source
- Several additional infections reported in China 1998-1999

2002: Virginia, USA (H7N7)

- 1 poultry factory worker tested positive

2003: China and Hong Kong (H7N7)

- 2 infections in a family that had traveled to China
- 1 recovered, 1 died (1 directly attributed to H7N7 infection)
- Source of infection not determined

2003: Netherlands (H7N7)

- Outbreaks on poultry and pig farms
- 89 confirmed infections, 1 death
- Most infections bird-human, 3 possible person-person

2003: Hong Kong (H9N2)

- 1 child infected, recovered

2003: New York, USA (H7N2)

- 1 confirmed human infection
- Source of infection not determined

2004: Thailand and Vietnam (H5N1)

- 35 confirmed human infections
- 23 deaths

2004: Canada (H7N3)

- Human infections associated with an outbreak among poultry

2004-2005: East and Southeast Asia (H5N1)

- Near simultaneous outbreaks in several countries
- Sporadic reports of human transmission
- Isolated report of probable person-person transmission in Thailand
- New outbreaks occur September 2005 in Indonesia. UN Food and Agriculture Organization calls H5N1 "endemic in Indonesia."

replication machinery. Although this results in a large number of defective copies whenever an influenza virus replicates, it also allows virus strains to change rapidly and evolve. Influenza viruses are unique because their genetic material is split into eight pieces. This allows influenza virus strains to easily exchange their genetic information with other, different influenza strains, in a process called genetic reassortment. For example, if a person were infected with a human influenza virus and an avian influenza virus at the same time, the two could theoretically merge and create a new strain that has the lethal characteristics of an avian virus, but that can transmit easily from human to human. Scientists are increasingly concerned by the possibility that Influenza A H5N1 viruses may evolve by mutation or reassortment and become easily transmissible from human to human.

So far, no sustained human-to-human transmission of the H5N1 subtype, the virus responsible for the most recent outbreaks in Asia, has been identified, and no evidence for genetic reassortment between human and avian influenza virus genes has been found. However, the current outbreaks in Asia pose an important public health threat. Some scientists have cautioned that a massive outbreak among humans is likely if public health officials are unable to control the spread of the virus among birds.

Current Outbreak: H5N1

The WHO has reported that H5N1 is of particular concern among avian influenza subtypes for several reasons. First, H5N1 has been shown to mutate rapidly, and has easily acquired new genes from other viruses through reassortment. Second, the strain has been found to be highly pathogenic, or highly capable of causing disease, and has been documented to cause severe illness in humans. Finally, birds that survive H5N1 infection have been shown to remain contagious for at least 10 days, leading to an increased threat of outbreaks among poultry markets and in migratory bird populations.



Workers dispose of culled chickens in Vietnam.
Photo © 2004 Reuters

The H5N1 virus was first isolated among wild birds in South Africa in 1961. It was detected among birds in 1996 in China's southeastern Guangdong province. Within a year, the virus was detected in nearby Hong Kong, causing an outbreak that affected poultry farms throughout the province. The virus infected 18 humans, causing severe respiratory problems in most and six deaths. Fears of a massive outbreak among humans led to the culling of all 3 million poultry in Hong Kong within three days. Although the initial 18 cases had reported direct exposure to infected poultry, investigators identified laboratory evidence of non-lethal infection among their healthcare workers, indicating a limited amount of human-to-human transmission.

Hong Kong's efforts to curb the spread of the virus through widespread culling were very successful. However, in 2003 two cases of H5N1 were detected in a Hong Kong family that had traveled to China. One patient died and the other recovered. Scientists were unable to determine the specific cause or geographical location of the infection.

Beginning in December 2003, outbreaks of H5N1 influenza in poultry were reported in nine Asian countries: Cambodia, China, Indonesia, Malaysia, Japan, Laos, South Korea, Thailand, and Vietnam. More than 140 million domestic birds have been slaughtered to help stop the spread. By March 2004, most outbreaks in the region had been controlled. Nevertheless, a limited number of human H5N1 cases have been identified. Through October 2004, at least 44 human cases, with 32 deaths, occurred in Thailand and Vietnam. In December 2004, the WHO warned that a global pandemic of Avian Influenza was "inevitable," and that it could kill two to seven million people worldwide.

Despite control efforts, the H5N1 influenza outbreaks in poultry populations returned throughout Southeast Asia, beginning in December 2004. From December 2003 through the middle of September 2005, more than 115 people were confirmed infected and 59 died as a result of H5N1 infection in Thailand, Cambodia, Indonesia, and Vietnam (see Appendix B). During the same period, the H5N1 virus resulted in the deaths of more than 150 million birds in 11 nations.

What Public Health Officials Are Doing

There is currently no vaccine that protects humans against the H5N1 virus. However, research into a vaccine is ongoing, and scientists began tests on a potential vaccine to protect humans against H5N1 in April 2005. The H5N1 virus currently infecting birds in Asia that has caused human illness and death is resistant to amantadine and rimantadine, two antiviral medications commonly used for influenza. Two other antiviral medications, oseltamavir and zanamavir, may prove effective in treating flu caused by the H5N1 virus, though studies still need to be conducted. Several governments around the world have begun stockpiling these drugs in advance of potential outbreaks. However, effective antiviral treatments must begin within 48 hours of the onset of symptoms, and the virus has proven to be adept at mutation and developing antiviral-resistant strains.

On July 6, 2005, international health experts at an Avian Influenza conference in Malaysia released a multi-point plan designed to pre-empt the spread of H5N1 to humans. Representatives at the conference concluded that priority should be given to small-scale and backyard farms, locations most affected by outbreaks so far. On September 14, 2005, the U.S. launched an international partnership to fight avian influenza. The partnership is designed to support preparedness, prevention, response, and containment of the disease. For more information, visit <http://usinfo.state.gov/gi/Archive/2005/Sep/22-113180.html>.

Steps You Can Take to Minimize Risk

The following are several measures you can take to help minimize the health risks of H5N1 exposure and infection (compiled from CDC and WHO travelers' health recommendations):

- Keep up-to-date on currently infected areas with the links listed below, and watch for special travel advisories from the State Department's Bureau of Consular Affairs at <http://travel.state.gov>, and from the Centers for Disease Control and Prevention at <http://www.cdc.gov/travel/>.

- Make every effort to avoid locations with concentrations of live birds in affected areas, including open-air food markets, small backyard or neighborhood coops, and poultry farms. If you have come into contact with these locations, you should monitor yourself for symptoms such as fever, cough, sore throat, muscle aches, and difficulty breathing, and be in close consultation with a healthcare provider. Check with your doctor to determine whether you can be using vaccinations against regular human influenza in order to help reduce the likelihood of co-infection, and thus reduce the risk of genetic reassortment.
- Do not eat uncooked or undercooked poultry or poultry products in affected areas, including dishes made with uncooked poultry blood. Additionally, practice safe food preparation techniques, such as keeping raw meat away from ready-to-eat foods, washing hands before and after handling raw meat and eggs, and carefully washing all surfaces and utensils after cooking.
- Practice careful and frequent hand-washing. Cleaning your hands often, using either soap and water or waterless, or alcohol-based hand rubs when soap is not available, helps remove potentially infectious materials from your skin and helps prevent disease transmission.
- If you are in a high-risk area and begin showing possible symptoms of influenza, consult a healthcare provider immediately. ***However, before you visit a health-care setting, tell the provider about your symptoms, whether you have had direct poultry contact, and where you traveled.*** U.S. embassies and consulates can provide names and addresses of local physicians.
- Do not travel while sick, and limit contact with others as much as possible to help prevent the spread of any infectious illness.

Links for More Information

[WHO Avian Influenza Resources and Links](#)

[CDC Avian Influenza Resources and Links](#)

[UK Dept. for Environment, Food and Rural Affairs \(DEFRA\) Avian Influenza Factsheet](#)

[European Commission Animal Health and Welfare Avian Influenza Information](#)

[U.S. Department of State's Bureau of Consular Affairs Travel Website](#)

[CDC Travel Advisories](#)

Appendix A: Human Cases of Avian Influenza A (H5N1) confirmed in 2004-2005
(as of 27 September 2005*)

| | Month of Confirmation | Indonesia | | Vietnam | | Thailand | | Cambodia | |
|----------|-----------------------|-----------|----------|-----------|-----------|-----------|-----------|----------|----------|
| | | Confirm | Death | Confirm | Death | Confirm | Death | Confirm | Death |
| 1st wave | Jan 2004 | 0 | 0 | 7 | 6 | 3 | 3 | 0 | 0 |
| | Feb 2004 | 0 | 0 | 15 | 9 | 7 | 4 | 0 | 0 |
| | Mar 2004 | 0 | 0 | 1 | 1 | 2 | 1 | 0 | 0 |
| 2nd wave | Aug 2004 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 |
| | Sep 2004 | 0 | 0 | 1 | 1 | 3 | 2 | 0 | 0 |
| | Oct 2004 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 |
| 3rd wave | Dec 2004 – Jun 2005 | 3 | 2 | 64 | 21 | 0 | 0 | 4 | 4 |
| | Total | 3 | 2 | 91 | 41 | 17 | 12 | 4 | 4 |

Source: WHO (http://www.wpro.who.int/health_topics/avian_influenza/data.htm)

* Since table published, there have been reports of 3 additional fatalities in Indonesia.

Appendix B: H5N1 Outbreaks in Asia

(Source: WHO, http://www.wpro.who.int/health_topics/avian_influenza)

